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Indian Standard
METHODS OF TEST FOR PULP
PART IX BLEACH REQUIREMENTS AND PREPARATION OF HAND SHEETS FOR OPTICAL TESTS OF PULP

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METHODS OF TEST FOR PULP

PART IX BLEACH REQUIREMENTS AND PREPARATION OF HAND SHEETS FOR OPTICAL TESTS OF PULP

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Indian Standard

METHODS OF TEST FOR PULP

PART IX BLEACH REQUIREMENTS AND PREPARATION OF HAND SHEETS FOR OPTICAL TESTS OF PULP

0. FOREWORD

0.1 This Indian Standard (Part IX) was adopted by the Indian Standards Institution on 30 March 1973, after the draft finalized by the Paper Sectional Committee had been approved by the Chemical Division Council.

0.2 For obtaining good quality of paper, it is essential that the pulp which goes into the manufacture of paper is properly cooked and bleached. Formulation of this standard had been taken up in order to guide the people working in pulp and paper mills for the methods to be adopted for pulp analysis.

0.3 To control the optical properties of the paper it is essential to know the extent of cooking carried out of the pulp. It is also essential to find out the requirement of the bleach liquor necessary to attain a certain degree of brightness. This standard lays down the procedure for estimating the bleach requirement of the pulp and the details of a rapid method for preparation of hand sheets for carrying out optical tests. This method is applicable to all types of pulps which can be bleached with calcium hypochlorite solution.

1. SCOPE

1.1 This standard (Part IX) prescribes the procedure for bleach requirement of pulp, and for the preparation of hand sheets for carrying out optical tests.

2. BLEACH REQUIREMENT OF PULP

2.1 Apparatus

2.1.1 *Polyethylene Jars* — 5, with wide mouth and screw type covers of 1 litre capacity each.

2.1.2 *Stirrer* — with stainless steel or glass impeller and shaft and having a speed of 100 to 200 rev/min.

2.1.3 *Water-Bath* — with thermostatic control.

2.1.4 *Brightness Tester*

2.2 Procedure

2.2.1 Take a representative sample of the pulp. Tear the sheet into pieces and defibre mechanically. Determine the dry contents of the sample. Weigh out 5 portions, each equivalent to 10 ± 0·1 g of moisture free pulp. Determine the permanganate number of another portion of the sample. Half of this value of permanganate number will give the approximate requirement of chlorine for bleaching.

2.2.2 Place each weighed portion of the pulp in 1-litre polyethylene jars. Mix thoroughly with distilled water by means of the stirrer to give a consistency of about 2 percent. Carefully measure out bleach liquor in steps of about 0·5 percent, above and below the estimated requirement. For example, if the estimated requirement of available chlorine is 10 percent on the mass of the pulp, then measure out bleach liquor corresponding to 9·0, 9·5, 10·0, 10·5 and 11·0 percent available chlorine. Dilute these samples of bleach liquor with enough distilled water so that when added to the pulp samples in polyethylene jars (2 percent consistency) the final consistency of the pulp samples in each jar is 1·24 to 1·26 percent of dry pulp. Cover the jars with lids and place them in a thermostatic bath at 55 ± 1°C. Allow the bleaching to continue, keeping the pulp agitated by occasionally manually shaking the jars. Test the supernatant liquor with starch iodide paper for presence of chlorine. Wash the pulps from different jars, make standard sheets as given in **3.2.1** and determine the brightness.

3. PREPARATION OF HAND SHEETS FOR OPTICAL TESTS OF PULP

3.0 General — This method provides rapid means for preparing hand sheets with bleached and unbleached pulps for optical tests, provided the pulp fibres are or can be separated.

3.1 Apparatus

3.1.1 *Disintegrator* — This shall be chromium plated to avoid possible discoloration of the pulp.

3.1.2 *Standard Pulp and Press with Pressure Gauge*

3.1.3 *Press Template*

3.1.4 *Drying Rings* — Three or more drying rings with rubber sealing for holding the sheets during drying.

3.1.5 *Buchner Funnel with Suction Flask*

3.1.6 *Graduated Cylinder*

3.1.7 *Rapid Draining Filter Paper*

3.2 Procedure

3.2.1 If the sample is available in dry form, break it into small pieces and dilute with distilled water. Stir in the disintegrator till the fibres are well separated. Dilute the specimen with distilled water so that the slurry contains 2 g of dry pulp per litre. Fit the buchner funnel with filter paper and wet it with distilled water from a wash bottle. Apply suction momentarily to seat the filter paper and pour 1 000 ml of pulp slurry in the funnel. Apply suction till the excess water has been removed. Then turn off the vacuum line and remove the funnel immediately so that air is not drawn through the sheet.

3.2.2 Lay two filter papers on the press and invert the buchner funnel over the press. Transfer the pulp sheet by blowing from the neck. Cover the pulp sheet with two or more blotting papers. Put the cover of the press and screw two of the diagonally opposite wing nuts. Raise the pressure to 345 KN/m^2 (approximately 3·5 kgf/cm^2) in 30 seconds and maintain it for 5 minutes. Release the pressure and remove the press cover. Fit the sheet into a set of drying rings. Dry the sheet in an atmosphere with relative humidity not more than 65 percent. After the sheets are thoroughly dry, remove them from the drying rings. Remove the filter paper and test the sheets for optical properties.

4. CALCULATION

4.1 Interpolate the amount of available chlorine which will give a brightness of 75. The percentage of this on the mass of dry pulp gives the required bleach. The two readings should not vary by more than 0·1 percent expressed as available chlorine.

INDIAN STANDARDS
ON
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1576-1967 Solid pressboard for electrical purposes
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1774-1961 Paper for permanent records
1775-1961 Base paper for sensitized paper
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6213 (Part V)-1971 Methods of test for pulp: Part V Solublity of pulp in one percent caustic soda solution
6213 (Part VI)-1971 Methods of test for pulp: Part VI Copper number of pulp
6213 (Part VII)-1971 Methods of test for pulp: Part VII Ash content in pulp